

Point of Sale Canopies

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Benya Lighting Design



Description

- For outdoor sales areas under canopies.
- LPD maximums will vary by four lighting zones and by classification (service station vs. general uses).



Design Criteria

- IESNA Lighting Handbook, Ninth Edition “Lighting Design Guide.”
- Lighting design criteria is selected for the four lighting zones:
 - LZ1 (IESNA “dark surround”).
 - LZ2 (IESNA “light surround”).
 - LZ3 (2x LZ2).
 - LZ4 (2x LZ3 for extreme conditions).



•Charles Eley:
•Jim, these are in conflict with what it says in the report. The report says that light surrounds are for LZ3 and that dark surrounds are for LZ2.

Design Criteria Decisions

Gas sales may occur in LZ1. None others allowed.

Security lighting is an issue for service stations in certain locations.

For gas stations:

LZ1 = 5 fc IESNA “dark” surround.

LZ2 = 10 fc IESNA “light” surround.

LZ3 = 20 fc 2x IESNA “light” surround.

LZ4 = 40 fc 4x IESNA “light” surround.

4. Other retail = 50% of gas stations.

This is the same as moving all levels up one LZ.

Outdoor

California Energy Efficiency



Observation

- IESNA values for exterior lighting tend to be in factors of 2x when going from one condition to the next.
- IESNA current standards are limited to dark and light surrounds.
- Extrapolation of IESNA values into LZ1 and LZ4 may be accomplished using powers of 2.



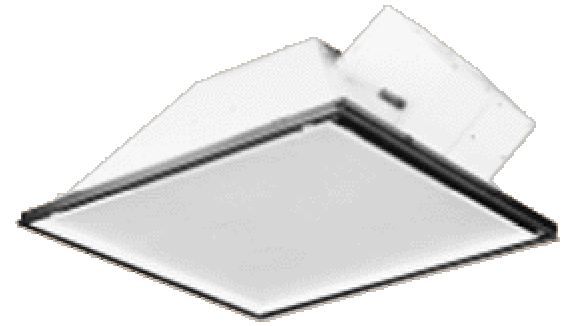
Confirmation of Base Decision

- Lighting at Yosemite Gas Station in Wawona (LZ1) uses cutoff lighting and 5 fc average illumination.
- Generally accepted by U.S. National Park Service and Yosemite Concession Services.

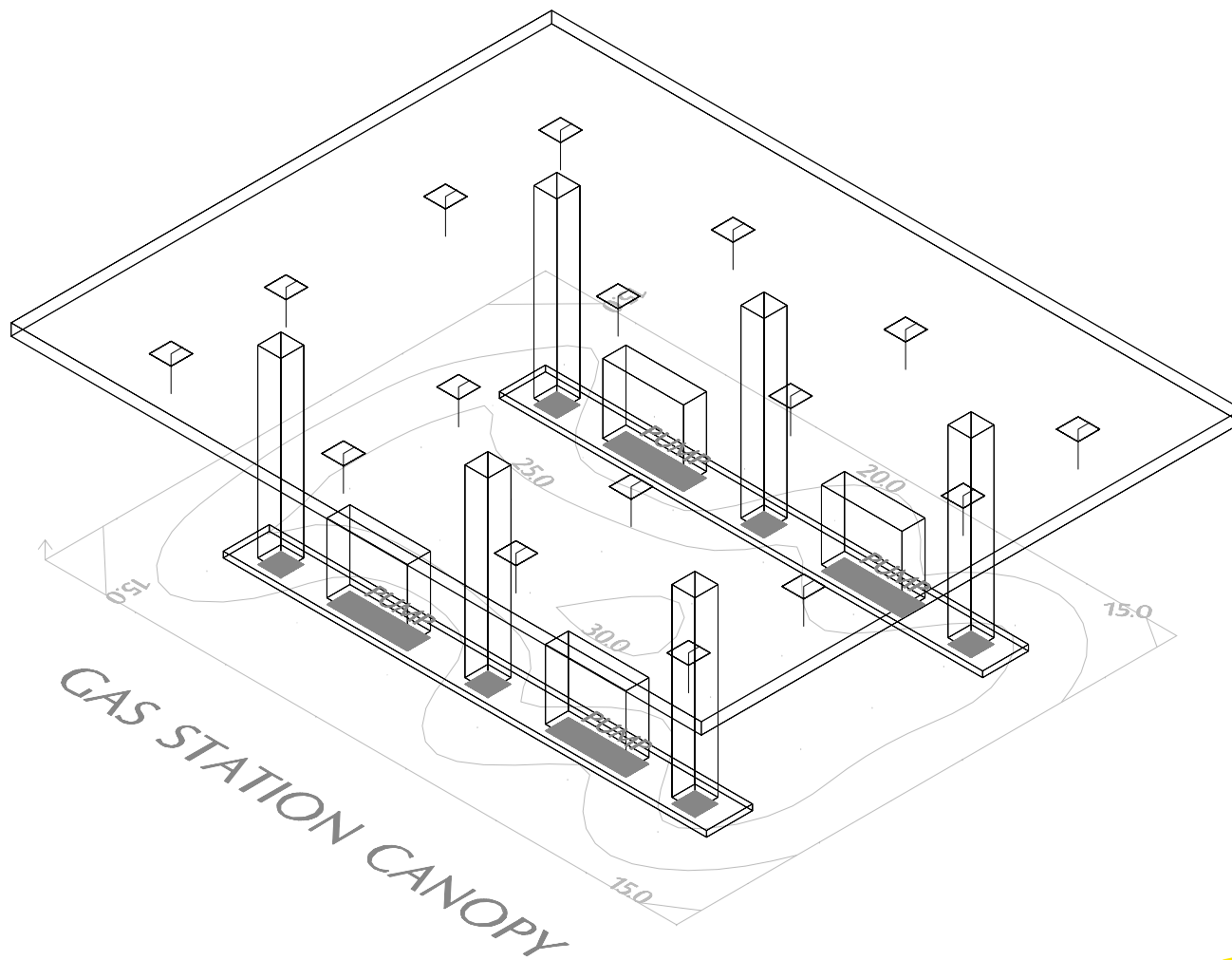


Equipment Used in Primary Model

- Lamps and ballasts:
 - Metal Halide lamps pulse start, horizontal burn position.
 - Mean lumens.
 - CWA ballasts.
- Luminaires
 - Standard Metal Halide recessed.
 - Light loss factor of 0.70.
 - Luminaire located as shown.



Primary Lighting Model



canopies



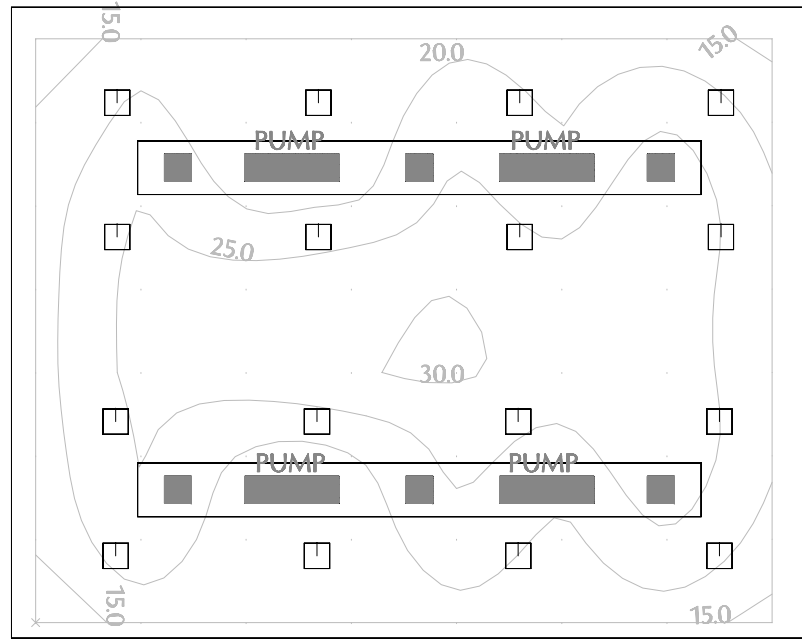
Calculations

- Software: Lighting Technologies Lumen Micro 2000.
- Design to slightly exceed criteria.



Calculation Results

This model is the 20 footcandle model used for the LZ3 level. Average illumination is over 20 fc maintained.



GAS STATION CANOPY

Recommendations

- LPD maximums in each lighting zone.
- Include requirements for lighting controls, maximum lighting power, and shielding of luminaires.
- Requirements are expressed by lighting zones.



Lighting Allowed Power

Canopy Type	Lighting Zone 1 Allowed LPD	Lighting Zone 2 Allowed LPD	Lighting Zone 3 Allowed LPD	Lighting Zone 4 Allowed LPD
Retail Gas and Service Stations (W/SF)	.25*	.75*	1.25	2.5
Other vehicle service stations (W/SF)	Not allowed	.50*	.75	1.25
Covered Outdoor Sales (W/SF)	Not allowed	.50*	.75	1.25
Other (W/SF)	Not allowed	.25	.50	.75

Asterisk (*) requires shutoff after close of business



Controls and Shielding

- Photosensors turn off lighting during daylight hours.
- All luminaires greater than 100 watts to be IESNA cutoff type.

